IN THE CLAIMS

Please amend claims 1, 2, 4, 5, 8, 11, 12, 13, 19-23, 26, and 29-30, cancel claims 3, 6, 7, 9, 10, 24, 25, 27 and 28, and add new claims 31-39 as follows:

1. (CURRENTLY AMENDED) An apparatus for receiving a non-coherent layered modulation signal comprising the sum of a first layer signal and a second layer signal, comprising:

a tuner for receiving ~~a~~ the non-coherent layered signal and producing a layered in-phase signal and a layered quadrature signal therefrom;

an analog-to-digital converter for digitizing the layered in-phase signal and the layered quadrature signal;

a digital processor for ~~decoding~~ processing the digitized layered in-phase signal and the digitized layered quadrature signal to produce a ~~single~~ lower layer in-phase signal, ~~and~~ a ~~single~~ lower layer quadrature signal, an upper layer in-phase signal and an upper layer quadrature signal, the processor comprising a subtractor configured to subtract an ideal upper layer in-phase signal from the digitized layered in-phase signal to produce the lower layer in-phase signal and to subtract an ideal upper layer quadrature signal from the digitized layered quadrature signal to produce the lower layer quadrature signal;

a digital-to-analog encoder for converting the ~~single~~ lower layer in-phase signal and the ~~single~~ lower layer quadrature signal to a ~~single~~ lower layer in-phase analog signal and a ~~single~~ lower layer quadrature analog signal; and

a modulator for modulating the ~~single~~ lower layer in-phase analog signal and the ~~single~~ lower layer quadrature analog signal to produce a ~~single~~ lower layer signal.

2. (CURRENTLY AMENDED) The apparatus of Claim 1, wherein the non-coherent layered signal is compatible with a legacy receiver such that at least one signal layer is decodable directly from the layered signal with the legacy receiver.

3. (CANCELED)

4. (ORIGINAL) The apparatus of Claim 1, wherein the processor comprises a logic circuit.

5. (CURRENTLY AMENDED) The apparatus of Claim 1, wherein decoding by the processor comprises match filtering the digitized layered in-phase signal and the digitized layered quadrature signal.

6. (CANCELED)

7. (CANCELED)

8. (CURRENTLY AMENDED) The apparatus of Claim ~~7~~ 1, wherein the digitized layered in-phase signal and the digitized layered quadrature signal are delayed to synchronize the subtraction.

9. (CANCELED)

10. (CANCELED)

11. (CURRENTLY AMENDED) The apparatus of Claim ~~9~~ 1, wherein ~~signal processing the ideal in-phase upper layer signal and the ideal quadrature upper layer signal comprises~~ the processor ~~applying~~ applies a signal map to the ideal upper layer in-phase ~~upper layer~~ signal and the ideal upper layer quadrature ~~upper layer~~ signal, the signal map accounting for transmission distortions of the non-coherent layered signal.

12. (CURRENTLY AMENDED) The apparatus of Claim ~~9~~ 1, wherein ~~signal processing the ideal in-phase upper layer signal and the ideal quadrature upper layer signal comprises~~ the processor amplitude and phase ~~matching~~ matches the ideal upper layer in-phase ~~upper layer~~ signal and the ideal upper layer quadrature ~~upper layer~~ signal with the digitized layered in-phase signal and the digitized layered quadrature signal, respectively.

13. (CURRENTLY AMENDED) A digital processor for decoding a non-coherent layered signal to produce a single layer signal, comprising:

a demodulator and decoder for decoding an upper layer signal from the non-coherent layered signal;

an encoder for generating an ideal upper layer signal from the decoded upper layer signal;

a signal processor for modifying the ideal upper layer signal to characterize transmission and processing effects; and

a subtractor for subtracting the modified ideal upper layer signal from the layered signal to produce the single layer signal.

14. (ORIGINAL) The digital processor of Claim 13, further comprising a delay function correlated to an output of the signal processor to appropriately delay the layered signal to synchronize amplitude and phase matching of the modified ideal upper layer signal and the layered signal.

15. (ORIGINAL) The digital processor of Claim 13, further comprising a delay function correlated to an output of the signal processor to appropriately delay the layered signal to synchronize subtraction of the modified ideal upper layer signal and the layered signal.

16. (ORIGINAL) The digital processor of Claim 13, wherein the signal processor applies a signal map to the ideal upper layer signal.

17. (ORIGINAL) The digital processor of Claim 13, wherein the signal processor performs finite impulse response matched filtering on the ideal upper layer signal.

18. (ORIGINAL) The digital processor of Claim 13, wherein the signal processor amplitude and phase matches the ideal upper layer signal with the layered signal.

19. (CURRENTLY AMENDED) A method of receiving a non-coherent layered modulation signal, comprising the steps of:

receiving [a] the non-coherent layered signal and producing a layered in-phase signal and a layered quadrature signal therefrom;

digitizing the layered in-phase signal and the layered quadrature signal;

~~decoding~~ processing the digitized layered in-phase signal and the digitized layered quadrature signal to produce a ~~single~~ lower layer in-phase signal, ~~and~~ a ~~single~~ lower layer quadrature signal, an upper layer in-phase signal, and an upper layer quadrature signal;

subtracting an ideal upper layer in-phase signal from the digitized layered in-phase signal to produce the lower layer in-phase signal and subtracting an ideal upper layer quadrature signal from the digitized layered quadrature signal to produce the lower layer quadrature signal;

converting the ~~single~~ lower layer in-phase signal and the ~~single~~ lower layer quadrature signal to a ~~single~~ lower layer in-phase analog signal and a ~~single~~ lower layer quadrature analog signal; and

modulating the ~~single~~ lower layer in-phase analog signal and the ~~single~~ lower layer quadrature analog signal to produce a single layer signal.

20. (CURRENTLY AMENDED) The method of Claim 19, wherein the non-coherent layered signal is compatible with a legacy receiver such that at least one signal layer is decodable directly from the layered signal with the legacy receiver.

21. (CURRENTLY AMENDED) The method of Claim 19, wherein the ~~single~~ lower layer signal from the modulator is decodable with a legacy receiver.

22. (CURRENTLY AMENDED) The method of Claim 19, wherein the step of ~~decoding~~ is performed by a logic circuit.

23. (CURRENTLY AMENDED) The method of Claim 19, wherein the step of ~~decoding~~ comprises match filtering the digitized layered in-phase signal and the digitized layered quadrature signal.

24. (CANCELED)

25. (CANCELED)

26. (CURRENTLY AMENDED) The method of Claim ~~25~~ 19, wherein the step of decoding further comprises delaying the digitized layered in-phase signal and the digitized layered quadrature signal to synchronize the subtraction.

27. (CANCELED)

28. (CANCELED)

29. (CURRENTLY AMENDED) The method of Claim ~~27~~ 19, ~~wherein signal processing the ideal in-phase upper layer signal and the ideal quadrature upper layer signal comprises~~ further comprising the step of applying a signal map to the ideal upper layer in-phase ~~upper layer~~ signal and the ideal upper layer quadrature ~~upper layer~~ signal, the signal map accounting for transmission distortions of the non-coherent layered signal.

30. (CURRENTLY AMENDED) The method of Claim ~~27~~ 19, ~~wherein signal processing the ideal in-phase upper layer signal and the ideal quadrature upper layer signal comprises~~ further comprising the step of amplitude and phase matching the ideal upper layer in-phase ~~upper layer~~ signal and the ideal upper layer quadrature ~~upper layer~~ signal with the digitized layered in-phase signal and the digitized layered quadrature signal, respectively.

31. (NEW) An apparatus for receiving a non-coherent layered modulation signal comprised of a sum of a first layer signal and a second layer signal, the apparatus comprising:

a tuner for receiving the non-coherent layered modulation signal and producing a layered in-phase signal and a layered quadrature signal;

an analog-to-digital converter for digitizing the layered in-phase signal and the layered quadrature signal;

a processor for processing the digitized layered in-phase signal and the digitized layered quadrature signal to produce a lower layer in-phase signal and a lower layer quadrature signal, an upper layer in-phase signal and an upper layer quadrature signal, the processor comprising:

a modulation map configured to modify the upper layer in-phase signal and the upper layer quadrature signal to account for transmission distortions of the layered modulation signal to produce an ideal upper layer in-phase signal and an ideal upper layer quadrature signal; and

a subtractor configured to subtract the ideal upper layer in-phase signal from the digitized layered in-phase signal to produce the lower layer in-phase signal and to subtract the ideal upper layer quadrature signal from the digitized layered quadrature signal to produce the lower layer quadrature signal;

a digital-to-analog converter for converting the lower layer in-phase signal and the lower layer quadrature signal to a lower layer in-phase analog signal and a lower layer quadrature analog signal; and

a modulator for modulating the lower layer in-phase analog signal and the lower layer quadrature analog signal to produce a single layer signal.

32. (NEW) The apparatus of Claim 31, wherein the processor is adapted to produce the layered in-phase signal and the layered quadrature signal by match filtering the layered in-phase signal and the layered quadrature signal.

33. (NEW) The apparatus of claim 31, wherein the lower layer signal is a legacy signal.

34. (NEW) The apparatus of Claim 31, wherein the processor is further configured to delay the digitized layered in-phase signal and the digitized layered quadrature signal to synchronize the subtraction of the ideal upper layer in-phase signal from the layered in-phase signal and the subtraction of the ideal upper layer in-phase signal from the layered in-phase signal.

35. (NEW) The apparatus of claim 34, wherein the processor further comprises:

a first delay element configured to apply a first delay to the digitized layered in-phase signal and the digitized layered quadrature signal;

an amplitude and phase matching coefficient generator, configured to generate amplitude and phase matching coefficients from the digitized and first delayed layered in-phase signal, the digitized and first delayed quadrature signal, the modified upper layer in-phase signal and the modified upper layer quadrature signal;

an amplitude and phase matcher configured to apply the amplitude and phase matching coefficients to the modified upper layer in-phase signal and the modified upper layer quadrature signal to generate the ideal upper layer in-phase signal and the ideal upper layer quadrature signal; and

a second delay element, configured to apply a second delay to the digitized and first delayed layered in-phase signal and the digitized and first delayed layered quadrature signal to produce the delayed digitized layered in-phase signal and the delayed digitized layered quadrature signal.

36. (NEW) A method of receiving a non-coherent layered modulation signal comprised of a sum of a first layer signal and a second layer signal, the method comprising the steps of:

receiving the layered modulation signal and producing a layered in-phase signal and a layered quadrature signal;

digitizing the layered in-phase signal and the layered quadrature signal;

decoding the layered in-phase signal and the layered quadrature signal to produce a lower layer in-phase signal, a lower layer quadrature signal, an upper layer in-phase signal and an upper layer quadrature signal, comprising the steps of:

modifying the upper layer in-phase signal and the upper layer quadrature signal to account for transmission distortions of the layered modulation signal to produce an ideal upper layer in-phase signal and an ideal upper layer quadrature signal;

subtracting the ideal upper layer in-phase signal from the layered in-phase signal to produce the lower layer in-phase signal;

subtracting the ideal upper layer quadrature signal from the layered quadrature signal to produce the lower layer quadrature signal;

converting the lower layer in-phase signal and the lower layer quadrature signal to a lower layer in-phase analog signal and a lower layer quadrature analog signal; and

modulating the lower layer in-phase analog signal and the lower layer quadrature analog signal to produce a single layer signal.

37. (NEW) The method of Claim 36, wherein the step of decoding further comprises delaying the digitized layered in-phase signal and the digitized layered quadrature signal to synchronize the subtraction of the ideal upper layer in-phase signal from the layered in-phase signal and the subtraction of the ideal upper layer in-phase signal from the layered in-phase signal.

38. (NEW) The method of claim 37, wherein the step of decoding the layered in-phase signal and the layered quadrature signal comprises the steps of:

applying a first delay to a the digitized layered in-phase signal and the digitized layered quadrature signal;

generating amplitude and phase matching coefficients from the digitized and first delayed layered in-phase signal, the digitized and first delayed quadrature signal, the modified upper layer in-phase signal and the modified upper layer quadrature signal;

applying the amplitude and phase matching coefficients to the modified upper layer in-phase signal and the modified upper layer quadrature signal to generate the ideal upper layer in-phase signal and the ideal upper layer quadrature signal;

applying a second delay to the digitized and first delayed layered in-phase signal and the digitized and first delayed layered quadrature signal to produce the delayed digitized layered in-phase signal and the delayed digitized layered quadrature signal.

39. (NEW) The method of claim 36, wherein the lower layer signal is a legacy signal.